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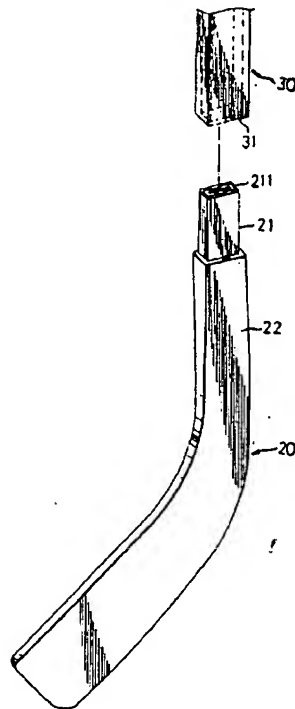
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(51) Int.Cl.<sup>6</sup> A63B 59/14  
(54) **BATON DE HOCKEY**  
(54) **HOCKEY STICK**



(57) Bâton de hockey comprenant un manche creux avec une extrémité inférieure et une lame en plastique renforcé de fibre avec une partie talon. La lame a un bout de raccordement à diamètre réduit qui s'étend vers le haut à partir de la partie talon et qui peut s'insérer dans l'extrémité inférieure du manche creux. Une pièce plate est fixée au bout de raccordement de la lame. On peut couper cette pièce plate pour l'insérer dans l'extrémité inférieure du manche creux sur lequel elle se met fermement en prise dans un ajustement serré.

(57) A hockey stick includes a hollow shaft with a lower end and a fiber-reinforced plastic blade with a heel portion. The blade has a diameter-reduced connecting end portion which extends upwardly from the heel portion and which is insertable into the lower end of the hollow shaft. A cuttable plate member is bonded to the connecting end portion. The cuttable plate member is capable of being cut in order to insert into and to engage firmly the lower end of the hollow shaft in an interference fit.



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ABSTRACT OF THE DISCLOSURE

A hockey stick includes a hollow shaft with a lower  
end and a fiber-reinforced plastic blade with a heel  
portion. The blade has a diameter-reduced connecting  
5 end portion which extends upwardly from the heel  
portion and which is insertable into the lower end of  
the hollow shaft. A cuttable plate member is bonded to  
the connecting end portion. The cuttable plate member  
is capable of being cut in order to insert into and to  
10 engage firmly the lower end of the hollow shaft in an  
interference fit.

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## HOCKEY STICK

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to a hockey stick, more particularly to a hockey stick having a fiber-reinforced plastic blade which can be connected to the lower ends of the hollow shaft of different inner diameters.

## 2. Description of the Related Art

As is well known, a conventional hockey stick comprises a blade and a hollow shaft which is connected to the blade. The heel portion of the blade has a diameter-reduced connecting end portion extending upward therefrom. The connecting end portion and the hollow shaft are rectangular in cross section so that the connecting end portion can be inserted complementarily into the lower end of the hollow shaft. The external surface of the connecting end portion is coated with a silicone adhesive so that the connecting end portion can be adhesively bonded to the internal face of the lower end of the hollow shaft.

Since the hollow shafts of the hockey sticks are manufactured by different manufactures, the inner diameters of the hollow shafts may have different tolerance limits. Therefore, when a user buys a hollow shaft of the hockey stick at a store and engages the same with his blade, he may found that the outer

diameter of the connecting end portion of his blade does not match perfectly with the inner diameter of the lower end of the hollow shaft. If the outer diameter of the connecting end portion is larger than the inner diameter of the hollow shaft, the user must reduce the outer diameter by means of cutting off a part of the connecting end portion of the blade. If the blade, however, is made of a fiber-reinforced plastic, it will be a hard work for the user to cut the connecting end portion of the blade. On the other hand, if the outer diameter of the connecting end portion of the blade is much smaller than the inner diameter of the hollow shaft, a lot of silicone adhesive is required to form an interlayer in order to secure the connecting end portion to the hollow shaft. The structure strength of the silicone interlayer is not strong enough to resist the shock waves transferred from the blade when the blade strike a puck, resulting in break of the silicone interlayer. This will result in the separation of the blade and the hollow shaft.

#### SUMMARY OF THE INVENTION

It is therefore a main object of the present invention to provide a hockey stick which has a blade that can engage firmly the hollow shaft of different inner diameters.

According to the present invention, a hockey stick comprises:

a hollow shaft having a lower end; and

5 a fiber-reinforced plastic blade with a heel portion having a diameter-reduced connecting end portion which extends upwardly from the heel portion and which is insertable into the lower end of the hollow shaft, the connecting end portion having a cuttable plate member bonded thereto, the cuttable  
10 plate member being capable of being cut in order to insert into and to engage firmly the lower end of the hollow shaft in an interference fit.

In a preferred embodiment, the cuttable plate member is made of wood and has a thickness of about 0.1  
15 mm to 10 mm.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of this invention will become apparent in the following detailed description of the preferred embodiments of this  
20 invention with reference to the accompanying drawings, in which:

Figure 1 is a fragmentary exploded perspective view of a preferred embodiment of a hockey stick according to the present invention;

25 Figure 2 is an enlarged view illustrating the connecting end portion of the preferred embodiment;

Figure 3 is a sectional view of the connecting end portion of Figure 2; and

Figures 4(A) to 4(G) are cross sectional views of the connecting end portion which illustrate various kinds of cuttable plate members which are bonded to the connecting end portion according to the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before the present invention is described in greater detail, it should be noted that the like elements are denoted by the like reference numerals throughout the disclosure.

Referring to Figure 1, a preferred embodiment of a hockey stick according to the present invention is shown to comprise a hollow shaft 30 with a lower end 31, and a blade 20 which is made of fiber-reinforced plastic.

The blade 20 has a heel portion 22 which has a diameter-reduced connecting end portion 21 that extends upwardly from the heel portion 22 and that is insertable into the lower end 31 of the hollow shaft 30. The connecting end portion 21 is rectangular in cross section and has a rectangular cuttable plate member 211 bonded therearound, as best illustrated in Figure 2. In this embodiment, the cuttable plate member 211 is made of wood and has a thickness of about 0.1 mm to 10 mm, as shown in Figures 3 and 4(A).

Therefore, the user can cut the cuttable plate member 211 in order to permit the connecting end portion 21 of the blade 20 to be inserted into and to engage firmly the lower end 31 of the hollow shaft 30 in an interference fit. A silicon adhesive may be applied to the external face of the cuttable plate member 211 in order to adhesively secure the connecting end portion 21 to the lower end 31 of the hollow shaft 30 after it is cured. In this way, the connecting end portion 21 can be secured to hollow shafts of different inner diameters.

Figures 4(B) to 4(G) are cross sectional views illustrating other types of cuttable plate members 211 which are bonded to the connecting end portion 21 of the blade 20 according to the present invention. The cuttable plate member 211 may include a pair of U-shaped plates 212 which are bonded to the connecting end portion 21 in an opposed manner with a clearance 2120 formed therebetween, as best illustrated in Figures 4(B) and 4(C). The cuttable plate member 211 may include a pair of plates 213 which are bonded to two opposed sides of the connecting end portion 21, as best illustrated in Figures 4(D) and 4(E). The cuttable plate member 211 may include two pair of plates 214 which are bonded to four sides of the connecting end portion 21, as best illustrated in Figure 4(F). The cuttable plate member 211 may include

four L-shaped plates 215 which are connected to four corners of the connecting end portion 21, as best illustrated in Figure 4(G).

5 While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest  
10 interpretations and equivalent arrangement.

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I CLAIM:

1. A hockey stick comprising:

a hollow shaft having a lower end; and

a fiber-reinforced plastic blade with a heel

5 portion having a diameter-reduced connecting end  
portion which extends upwardly from said heel portion  
and which is insertable into said lower end of said  
hollow shaft, said connecting end portion having a  
cuttable plate member bonded thereto, said cuttable  
10 plate member being capable of being cut in order to  
insert into and to engage firmly said lower end of said  
hollow shaft in an interference fit.

2. A hockey stick as claimed in Claim 1, wherein said  
cuttable plate member is made of wood.

15 3. A hockey stick as claimed in Claim 1, wherein said  
cuttable plate member has a thickness of about 0.1 mm  
to 10 mm.

4. A hockey stick as claimed in Claim 1, wherein said  
connecting end portion is rectangular in cross section,  
20 said cuttable plate member including a pair of U-shaped  
plates which are bonded to said connecting end portion  
in an opposed manner with a clearance formed  
therebetween.

5. A hockey stick as claimed in Claim 1, wherein said  
25 connecting end portion is rectangular in cross section,  
said cuttable plate member including a pair of plates  
which are bonded to two opposed sides of said

connecting end portion.

6. A hockey stick as claimed in Claim 1, wherein said  
connecting end portion is rectangular in cross section,  
said cuttable plate member including two pair of plates  
5 which are bonded to four sides of said connecting end  
portion.

7. A hockey stick as claimed in Claim 1, wherein said  
connecting end portion is rectangular in cross section,  
said cuttable plate member including four L-shaped  
10 plates which are connected to four corners of said  
connecting end portion.

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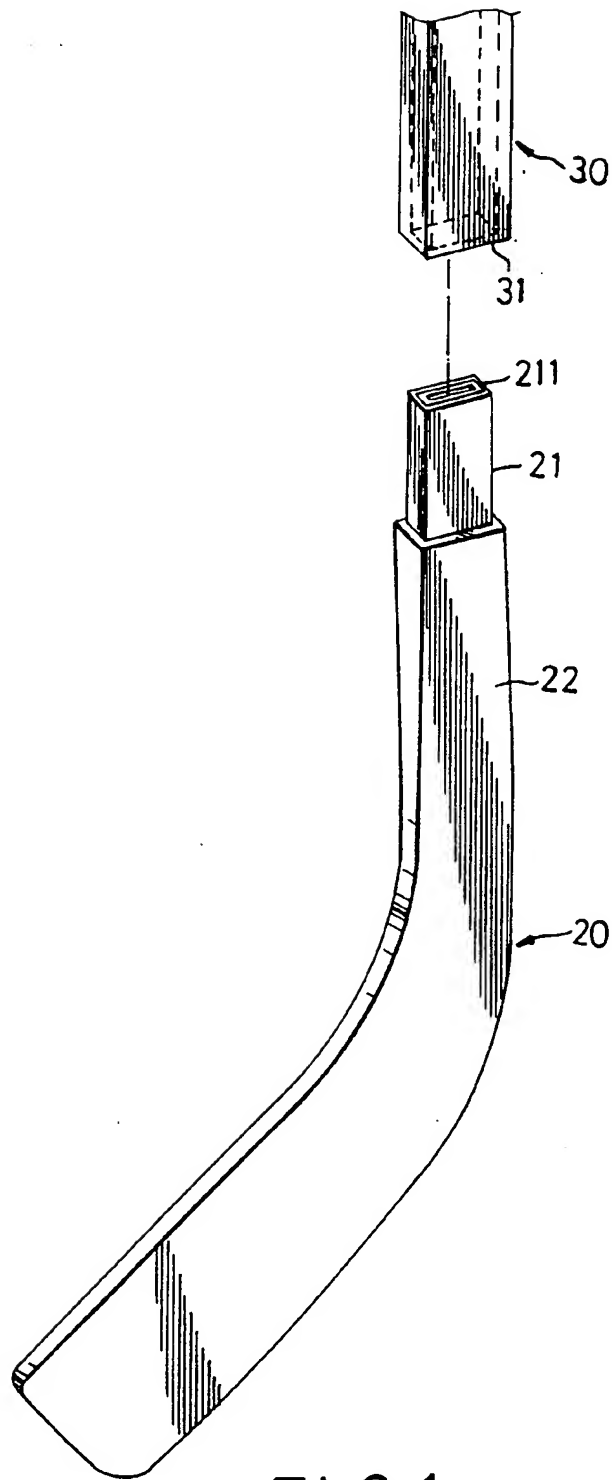
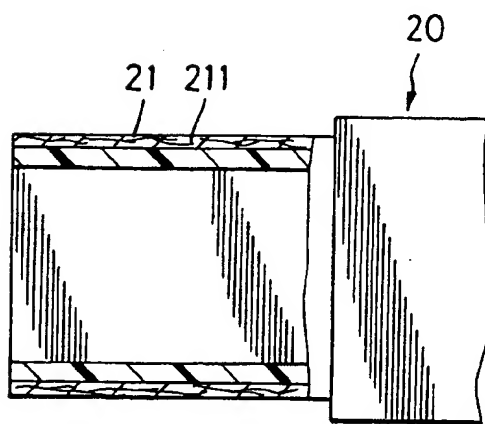
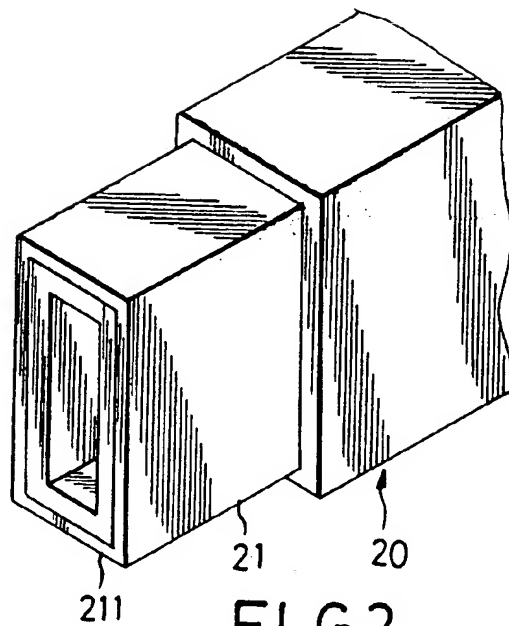


FIG. 1

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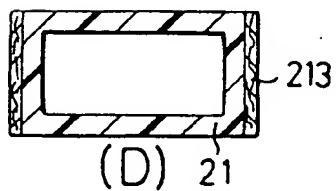
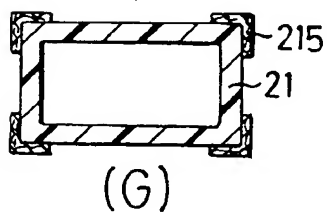
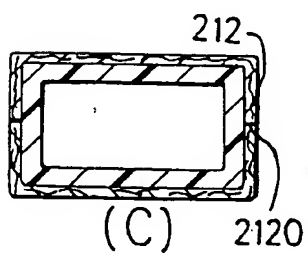
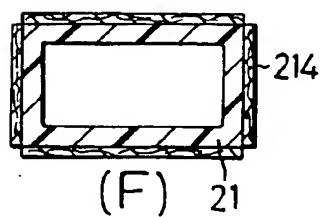
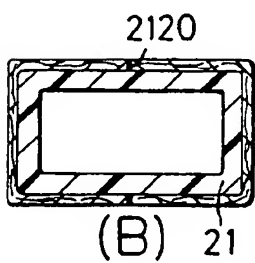
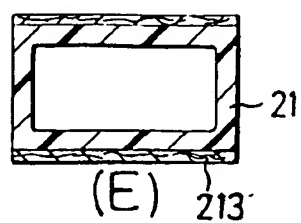
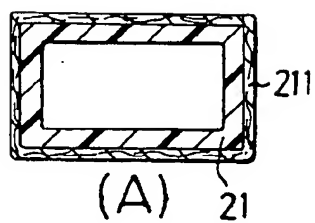


FIG.4

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Patent Attorneys

